

Energy Efficiency Question 4: What is the history of the cost of conserved energy for natural gas and electric efficiency programs in Michigan by class (residential and non-residential)? How does this cost compare to the costs of new and existing generation? What is the history of savings for participants and non-participants?

Executive Summary

1. The costs to administer energy optimization (EO) programs and the associated energy savings are tracked by customer class (residential and commercial/industrial) for both natural gas and electric providers and can be used to calculate the “cost of conserved energy.” The Michigan Public Service Commission (MPSC) reported in November 2012 that the overall cost of conserved energy for EO programs was \$20 per megawatt-hour (MWh).¹ The cost of conserved energy is generally higher for residential programs than commercial and industrial customers and also varies by utility, specific program type, and other factors.

The cost of conserved energy by customer class for the first two full years of the EO programs (2010 and 2011), is shown below. These data are based only on the programs administered by DTE Energy and Consumers Energy; the ranges reflect different amounts by year and by utility.

	Residential	Commercial and Industrial
Electric (cost of conserved energy)	1.1¢–1.4¢ per kWh	0.8¢–1.23¢ per kWh
Natural gas (cost of conserved energy)	\$1.40–\$3.48 per Mcf	\$0.50–\$1.35 per Mcf

2. Historically, the levelized cost per unit of electricity saved (\$/kWh) from EO programs has been significantly less than the estimated levelized cost of both new and existing generation.
3. The MPSC has reported that for every dollar spent on EO programs, it returns \$3.55–\$4.88 in savings.² The savings are in the form of the lifetime savings from the energy efficiency measures and the avoided cost to the utility from the reduced usage (e.g., fuel). There are other benefits that are not quantified.
4. The cost of conserved energy and cost-benefit results for EO programs are important to consider as utilities and the state examine different options for meeting Michigan’s energy needs in the future. But there are other factors to consider when evaluating demand- and supply-side options to meet Michigan’s long-term needs in a reliable, affordable manner. As discussed further under Energy Efficiency Question 7, EO programs can result in long-term benefits but can put upward pressure on rates in the near term, and the standards need to be achievable over the long-term.

1. The cost of conserved energy for EO programs as reported by the MPSC was \$20 per MWh.

Exhibits 1 and 2 detail the cost of conserved energy by class for electric and natural gas EO programs for Consumers Energy and DTE Energy, respectively, in 2010 and 2011, the first two full years the EO programs were in operation.

¹ Michigan Public Service Commission, *2012 Report on the Implementation of P.A. 295 Utility Energy Optimization Programs*, November 2012, p. 8.

² Michigan Public Service Commission, *2011 Report on the Implementation of P.A. 295 Utility Energy Optimization Programs*, November 2011; Michigan Public Service Commission, *2012 Report on the Implementation of P.A. 295 Utility Energy Optimization Programs*, November 2012. See also *Report on the Implementation of The P.A. 295 Renewable Energy Standard and the Cost-Effectiveness of the Energy Standards*, February 2013.

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EXHIBIT 1: Consumers Energy EO Program Cost of Conserved Energy

	2010	2011
Electric Levelized (¢/kWh)		
Residential	1.4¢	1.1¢
Non-Residential	0.8¢	0.8¢
Total Electric	1.0¢	1.0
Electric Levelized (\$/MWh)		
Residential	\$14.00	\$11.00
Non-Residential	\$8.00	\$8.00
Total Electric	\$10.00	\$10.00
Gas Levelized (\$/Mcf)		
Residential	\$1.40	\$3.48
Non-Residential	\$0.96	\$1.35
Total Gas	\$1.10	\$2.11

SOURCE: Consumers Energy Company's 2010 and 2011 Energy Optimization Annual Reports

EXHIBIT 2: DTE Energy EO Program Cost of Conserved Energy

	2010	2011
Electric Levelized (¢/kWh)		
Residential	1.10¢	1.24¢
Non-Residential	1.19¢	1.23¢
Total Electric	1.14¢	1.23¢
Electric Levelized (\$/MWh)		
Residential	\$11.00	\$12.40
Non-Residential	\$11.90	\$12.30
Total Electric	\$11.40	\$12.30
Gas Levelized (\$/Mcf)		
Residential	\$2.35	\$02.17
Non-Residential	\$0.72	\$0.50
Total Gas	\$1.65	\$1.28

SOURCE: DTE Energy.

Data for 2012 could be provided at a later date after the numbers have been reconciled as part of the measurement and verification process.

2. Historically, the levelized cost per unit of electricity saved (\$/kWh) from EO programs has been significantly less than the estimated levelized cost of both new and existing generation.

Using the MPSC overall estimate of \$20 per MWh or the company-specific data for DTE Energy and Consumers Energy in the range of \$10.00-\$12.30 per MWh, the levelized cost of EO programs has been significantly less than the cost of existing generation or new generation. For example, the Energy Information Administration (EIA) levelized cost estimates for new generation are \$63/MWh for a new natural gas plant, \$96/MWh for wind energy, and \$111/MWh for a coal plant assuming in-service dates in 2017.³ The MPSC has previously estimated a new coal plant at \$133/MWh.⁴ The per-unit cost of existing generation for DTE Energy and Consumers Energy is also higher than the cost of EO programs. There are considerable uncertainties and other considerations related to these cost estimates for various generation technologies and the existing cost of generation. In addition, costs for EO programs are expected to increase over time based on trends in Michigan and nationally. See Renewable Energy Question 3 and Energy Efficiency Questions 7 and 22 for a more in-depth discussion of these trends and uncertainties.

³ See U.S. Energy Information Administration, Annual Energy Outlook 2012, June 2012, DOE/EIA-0383(2012). Available at http://www.eia.gov/forecasts/aeo/electricity_generation.cfm. The natural gas plant estimate is for an advanced combined cycle unit.

⁴ MPSC, *Report on the Implementation of The P.A. 295 Renewable Energy Standard and the Cost-Effectiveness of the Energy Standards*, February 2013.

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3. The MPSC has reported that for every dollar spent on EO programs, it returns \$3.55–\$4.88 in savings. There are other benefits that are not quantified.

The MPSC’s cost-effectiveness calculations for EO programs are shown below. Savings are in the form of the lifetime savings from the energy efficiency measures and the avoided cost to the utility from the reduced usage (e.g., fuel). The 2010 numbers were based on DTE and Consumers Energy results, and the 2011 numbers also include Efficiency United.⁵ For additional detail, see Energy Efficiency Question 2, which addresses the methods to measure the cost-effectiveness of energy efficiency programs and the studies that have done so.

Year	Program Spending	Lifecycle Savings	Savings per Dollar Spent
2010	\$113 million	\$554 million	\$4.88
2011	\$205 million	\$709 million	\$3.55

SOURCE: MPSC.

This analysis does not break down the savings between customers who participated in the EO programs (“participants”) and those who do not (“non-participants”).

It is important to note that the cost-benefit calculations do not account for all benefits associated with energy efficiency. These include, but are not limited to:

- Lower emissions
- Utility bill savings for businesses and homeowners and the “multiplier effect” of those dollars being reinvested in other parts of the economy
- Improved comfort and safety of homes and other buildings
- Additional jobs and revenue for local contractors and Michigan-based manufacturers, such as based Dow, Nuwool, Applegate, Whirlpool, and others

4. The cost of conserved energy and cost-benefit results for EO programs are important to consider as utilities and the state examine different options for meeting Michigan’s energy needs in the future. Other factors must also be considered.

The results of EO programs to date are not the only factors to consider when evaluating demand- and supply-side options to meet Michigan’s long-term needs in a reliable, affordable manner. As discussed further under Energy Efficiency Question 7, EO programs can result in long-term benefits but can put upward pressure on rates in the near term, and the standards need to be achievable over the long term and based on the actual potential to achieve cost-effective energy savings in Michigan.

⁵ See MPSC November 2012 report for details.